

AUG 11 2006

Docket No. F-8290

Ser. No. 10/501,654

**AMENDMENTS TO THE CLAIMS:**

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) A method of manufacturing a torsion bar having a spring portion in a midway area in a longitudinal direction and joint portions on both ends in the longitudinal direction, comprising:

a first shaping step of reducing a diameter of a steel object material by reduction of cross-sectional area of said steel object by an amount within a predetermined range by according to cold drawing work so as to heighten a hardness of said an-entire steel object material within a predetermined range, said steel object being cold drawn in its entire longitudinal length to reduce the diameter thereof along said entire longitudinal length of said steel object to thereby heighten the hardness of said entire longitudinal length of said steel object; and

a second shaping step of cutting the midway area of the steel object material in the longitudinal direction so as to obtain the spring portion.

2. (Previously Presented) A method of manufacturing a torsion bar having a spring portion in a midway area in a longitudinal direction and joint portions on both ends in the longitudinal direction, comprising:

Docket No. F-8290

Ser. No. 10/501,654

a first shaping step of reducing a diameter of a steel material by reduction of cross sectional area by an amount within a predetermined range according to cold drawing work so as to heighten a hardness of an entire steel material within a predetermined range; and

a second shaping step of cutting the midway area of the steel material in the longitudinal direction so as to obtain the spring portion, wherein the Vickers hardness (HV) of the entire steel material after the cold drawing work is 320 to 450.

3. (Previously Presented) A method of manufacturing a torsion bar having a spring portion in a midway area in a longitudinal direction and joint portions on both ends in the longitudinal direction, comprising:

a first shaping step of reducing a diameter of a steel material by reduction of cross sectional area by an amount within a predetermined range according to cold drawing work so as to heighten a hardness of an entire steel material within a predetermined range; and

a second shaping step of cutting the midway area of the steel material in the longitudinal direction so as to obtain the spring portion, wherein the reduction of cross sectional area is 12 to 15%.

Docket No. F-8290

Ser. No. 10/501,654

4. (Currently Amended) The method of manufacturing the torsion bar according to claim 1, wherein ~~in~~ at the first shaping step, the diameter of the shaped steel object material is reduced by the cold drawing work so as to be slightly larger than a finished diameter of the joint portions, and at the second shaping step, the spring portion and the joint portions are cut so that the finished diameter of the joint portions is attained.

5. (Previously Presented) A method of manufacturing a torsion bar having a spring portion in a midway area in a longitudinal direction and joint portions on both ends in the longitudinal direction, comprising:

a first shaping step of reducing a diameter of a steel material by reduction of cross sectional area by an amount within a predetermined range according to cold drawing work so as to heighten a hardness of an entire steel material within a predetermined range; and

a second shaping step of cutting the midway area of the steel material in the longitudinal direction so as to obtain the spring portion, wherein at the first shaping step, the cold drawing work is carried out a plurality of times, and in an equation  $\gamma = \{(A0 - A1) / A0\} \times 100$  in which the reduction of cross sectional area of the steel material at each time is  $\gamma(\%)$ , a cross section of the steel material before the drawing work is A0, and a cross section of the steel material after final work of the drawing work is A1, the reduction of cross

Docket No. F-8290

Ser. No. 10/501,654

sectional area is set to 12 to 15%, and the Vickers hardness (HV) is set to 320 or more.

6. (Currently Amended) The method of manufacturing the torsion bar according to claim 1, further comprising ~~a blueing step of performing blueing work on the steel object material before or after the second shaping step.~~

7. (Currently Amended) A torsion bar having a spring portion in a midway area in a longitudinal direction and joint portions on both ends in the longitudinal direction, said torsion bar being manufactured by a first shaping step of reducing a diameter of a steel object material by reduction of cross sectional area of said steel object by an amount within a predetermined range by according to cold drawing work so as to heighten a hardness of said an entire steel object material within a predetermined range, said steel object being cold drawn in its entire longitudinal length to reduce the diameter thereof along said entire longitudinal length of said steel object to thereby heighten the hardness of said entire longitudinal length of said steel object, and ~~a~~ the second shaping step of cutting the midway area of the steel object material in the longitudinal direction so as to obtain the spring portion.

Docket No. F-8290

Ser. No. 10/501,654

8. (Currently Amended) The torsion bar according to claim 7, wherein Vickers hardness (HV) measurements of said steel object along said entire longitudinal length thereof ~~the hardness of the entire steel material~~ after the cold drawing are in the range of work ~~is 320 to 450 by Vickers hardness (HV)~~ testing.

9. (Previously Presented) A torsion bar having a spring portion in a midway area in a longitudinal direction and joint portions on both ends in the longitudinal direction, said torsion bar being manufactured by a first shaping step of reducing a diameter of a steel material by reduction of cross sectional area by an amount within a predetermined range according to cold drawing work so as to heighten a hardness of an entire steel material within a predetermined range and the second shaping step of cutting the midway area of the steel material in the longitudinal direction so as to obtain the spring portion, wherein the reduction of cross sectional area is 12 to 15 %.

10. (Currently Amended) The method of manufacturing a torsion bar according to claim 1, wherein said steel object ~~material~~ is configured in a solid shape which is not hollow in [[a]] the longitudinal direction.

Docket No. F-8290

Ser. No. 10/501,654

11. (Currently Amended) The torsion bar according to claim 7, wherein said steel object material is configured in a solid shape which is not hollow in the [[a]] longitudinal direction.

12. (Currently Amended) The method of manufacturing a torsion bar according to claim 1, wherein said steel object material has a uniform diameter along said entire longitudinal length thereof after said first shaping step.

13. (Currently Amended) The torsion bar according to claim 7, wherein said steel object material has a uniform diameter along said entire longitudinal length thereof after said first shaping step.

14. (Currently Amended) An apparatus comprising:  
the torsion bar manufactured by the manufacturing method according to claim 1;

a steering wheel; and

a steering gear box, wherein

said torsion bar is a torsion bar for transmitting a rotating power of said steering wheel to said steering gear box.

15. (Previously Presented) An apparatus comprising:

Docket No. F-8290

Ser. No. 10/501,654

the torsion bar according to claim 7;

a steering wheel; and

a steering gear box, wherein

said torsion bar is a torsion bar for transmitting a rotating power  
of said steering wheel to said steering gear box.